REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 3 and 9-12 are presently pending in this application, Claims 7-8 having been canceled and Claims 1, 9 and 12 having been amended by way of the present amendment.

In the outstanding Office Action, Claim 12 was objected to for informalities, and Claims 1, 3 and 7-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over JP 10-317084 (hereinafter "JP '084").

With regard to the objection to Claim 12, this claim is amended herein to correct the informalities noted in the outstanding Office Action. Therefore, the objection to Claim 12 is overcome by the present amendment.

Turning now to the merits, Applicants' invention is directed to a continuous casting method and apparatus. As discussed in the Background section of Applicants' specification, conventional continuous casting methods provided cooling to both a casting wheel and an endless belt, thereby causing defects in a center of the casting member which cannot be eliminated by reworking such as rolling extruding or drawing.[1] As also discussed in Applicants' specification, the present inventors recognized that differentiating the temperature between the endless belt and casting wheel can bring the casting defects closer to a surface of the cast member where they can be reworked.[2]

The embodiment of Figs. 3-5 of Applicant's specification shows a continuous casting apparatus including a casting wheel 20 and an endless belt. The casting wheel 20 is cooled by cooling water nozzles 23, but the burner 26 heats the endless belt 21. As discussed in the

[1] Applicants' published specification at paragraphs 4-5.
[2] Applicants' published specification at paragraphs 33.

amendment filed September 11, 2007, the combination of cooling the casting wheel and heating the endless belt easily produces a temperature gradient in the cast member. In one embodiment, a heating temperature of the endless belt is set to control the solidification point for an aluminum or aluminum alloy cast member.[3] Further, Applicants' specification explains that the burner 26 in Fig. 3, heats the belt 21 at a point where the molten metal M comes in contact with the belt (for example R2 in Fig. 3) in order to provide high precision solidification control.[4] Although the temperature of the endless belt which is being driven slightly changes in temperature from before the endless belt comes into contact with the molten alloy to after casting, controlling the temperature of the portion of the endless belt where it comes into contact with the molten alloy where the solidification rate is directly affected provides high accuracy solidification control.

In order to expedite issuance of a patent in this case, independent Claim 1 has been amended to clarify the patentable features of the present invention over the cited references. Specifically, Claim 1 recites a continuous casting method for continuously manufacturing an aluminum or aluminum alloy metal cast member. The method includes driving a casting wheel with a groove formed on an external peripheral surface thereof and an endless belt put on the casting wheel so as to close the groove in a direction of casting. The casting wheel and the endless belt are differentiated in temperature therebetween by heating a portion of the endless belt where molten metal starts to come into contact with to a temperature of ((melting point or liquidus-line temperature of the aluminum or aluminum alloy metal) x 0.35) or above before the endless belt starts to come into contact with the molten metal and cooling the casting wheel. Independent Claim 12 includes similar features in apparatus claim format.

[3] Applicants' published specification at paragraphs 65.
[4] Applicants' published specification at paragraphs 66.

Thus, independent claims 1 and 12, as amended, recite the following casting conditions specific to the present invention:

(a) the combination of cooling the casting wheel and heating the endless belt, which easily creates the temperature gradient in the cast member;

(b) the temperature of the endless belt, i.e., a temperature of ((melting point or liquidus temperature of the metal) x 0.35) or above, which is appropriate to casting of an aluminum or aluminum alloy; and

(c) the position of the endless belt, i.e., the portion of the endless belt where the molten alloy starts to come into contact with, where the temperature control is performed.

JP '084 is directed to a technique for controlling the cross sectional ratio of the crystallized object by a flow velocity of molten metal in a continuous casting method using a rotation wheel and an endless belt. However, this reference has nothing whatsoever to do with shifting the final solidification portion of the casting member to allow effective rework of the casting member, and does not discuss conditions for shifting the solidification portion of the casting member. In particular, JP '084 is completely silent about a temperature of the rotation wheel and endless belt. The Office Action acknowledges that JP '084 does not disclose that the casting wheel and the endless belt are differentiated in temperature therebetween by heating a portion of the endless belt where molten metal starts to come into contact with to a temperature of ((melting point or liquidus-line temperature of the aluminum or aluminum alloy metal) x 0.35) or above, but concludes that it would be obvious for one of ordinary skill in the art to optimize the temperature of the endless belt to arrive at this claimed feature.

However, it is well settled that a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See MPEP '

2144.05 II B. As discussed in Applicants' specification, the present inventors recognized that differentiating the temperature of the endless belt and casting wheel (i.e., the variable) effects a location of defects (i.e., the result) in that casting member to facilitate rework of the casting member. In contrast, JP '084 is completely silent about the relative temperatures of the endless belt and is completely silent about controlling the location of defects in the casting member. Thus, ***JP'084 does not disclose either the claimed variable or the result achieved by such variable.*** Therefore, it is improper to conclude that the claimed variable would be obvious to optimize.

The Office Action also concludes that it would be "obvious to try to find a control temperature for the endless belt" under Supreme Court's recent *KSR* decision. However, Applicants respectfully submit that *KSR* is not applicable to the facts of this case. Specifically, *KSR* deals with the situation where all of the claimed features are found in different prior art references. The Court answered the question of whether it would be obvious for one of ordinary skill in the art to combine all of the claimed features to arrive at the invention. As noted above, in this case, the claimed limitations regarding differentiating the temperature of the endless belt and casting wheel are completely missing from the prior art. Therefore, the rejection based on *KSR* is also improper.

For the foregoing reasons, Claims 1 and 12 are believed to be allowable. Furthermore, since Claims 3 and 9-11 depend directly or indirectly from Claim 1, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 3 and 9-11 are believed to be allowable as well.

In view of the amendments and discussions presented above, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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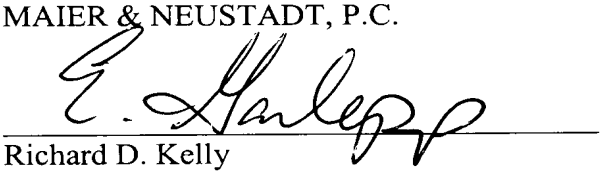

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